PATENT ABSTRACTS OF JAPAN

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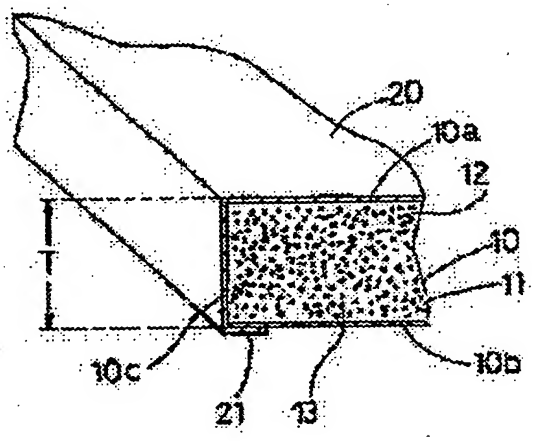
(54) BUILDING MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a building material capable of absorbing odor in the air to clean the air and having an excellent absorbing/desorbing function of moisture.

SOLUTION: This building material is provided with a core material 10 in which zeolite perticles 12 and diatomaceous earth perticles 13 are mixed together in gypsum 11, and an air-permeable and water-permeable surface skin material 12 fixed to the surface of the core material 10. Further, the weight ratio of the zeolite perticles 12 and the diatomaceous earth perticles 13 to the whole core material 10 is 10-40%, 10-40% respectively. Further, the weight ratio of the sum of the zeolite perticles and the diatomaceous earth perticles to the whole core material is at most 60%.



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Claim(s)]
[Claim 1] the permeability fixed to the front face of the core which made the zeolite particle group and the diatomaceous earth particle group intermingled in gypsum fibrosum, and this core, and a connoisseur -- the building materials characterized by providing aquosity **** epidermis material.
[Claim 2] the core of said zeolite particle group -- the weight ratio to the whole -- 10 thru/or 40% -- it is -- the core of said diatomaceous earth particle group -- the weight ratio to the whole -- 10 thru/or 40% -- it is -- and the core of the sum total of said zeolite particle group and said diatomaceous earth particle group -- the building materials according to claim 1 characterized by the weight ratio to the whole being 60 or less %.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] Especially this invention relates to building materials with the high capacity which can purify air and carries out absorption and desorption of moisture about building materials.
[0002]
[Description of the Prior Art] Plaster board is used as building materials from the former. An applicant for this patent makes what was used as the building materials which improve this plaster board and can purify air by the zeolite particle group in plaster board first Japanese Patent Application No. No. 285153 [seven to], and does patent application, and application disclosure of this application is carried out as JP,9-125538,A.
[0003]
[Problem(s) to be Solved by the Invention] However, although the above-mentioned conventional example was excellent as building materials which can purify air, since absorption-and-desorption-of-moisture capacity was not enough, it was not able to adjust indoor humidity and was not able to prevent dew condensation. Therefore, it is offering building materials excellent in absorption-and-desorption-of-moisture capacity while the technical problem of the invention in this application can abolish the fault of the above-mentioned conventional example, can absorb the smell in air and can purify air.
[0004]
[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the configuration of the 1st of invention of this application is a passage according to claim 1. It is an aquosity **** thing. the epidermis material fixed on the surface of the core by the configuration of invention of the above 1st -- permeability and a connoisseur -- the moisture in air and air -- this epidermis material -- passing -- permeability and a connoisseur -- the core which uses aquosity **** gypsum fibrosum as a principal component -- reaching -- among those, air -- said core, while being deodorized by the inner zeolite particle group and purified the moisture in air -- said core -- absorption/emission is carried out by the inner diatomaceous earth particle group, and absorption and desorption of moisture is performed. For this reason, change of the relative humidity of air can be lessened.
[0005] Furthermore, the 2nd configuration of invention is a passage according to claim 2. By the configuration of invention of the above 2nd, with the operation by the configuration of invention of the above 1st the core of said zeolite particle group, since the weight ratios to the whole are 10 thru/or 40% While said zeolite particle group can perform deordorization and clarification of air efficiently the core of said diatomaceous earth particle group -- since the weight ratios to the whole are 10 thru/or 40%, absorption/emission of the moisture in air can be efficiently carried out by said diatomaceous earth particle group, and absorption and desorption of moisture of air can be carried out. furthermore, the core of the sum total of said zeolite particle group and particle group of said diatomaceous earth -- since the weight ratio to the whole is 60 or less % -- the core of gypsum fibrosum -- since the weight ratio to the whole is maintained to 40% or more and a role of a binding material of gypsum fibrosum is not spoiled, the reinforcement of a core can be maintained.
[0006]
[Embodiment of the Invention] Drawing 1 shows the important section of the gestalt of operation of the invention in this application, drawing 2 shows the gestalt of operation equivalent to the modification of drawing 1 , and drawing 3 and drawing 4 show the actual example of the gestalt of each operation. In drawing 1 thru/or drawing 4 , building materials are panels-like and consist of epidermis material 20 fixed to this front face so that the front face of a core 10 and a core 10 might be worn. In addition, building materials may not be panels-like. In drawing 1 , although the epidermis material 20 has covered both sides (both front faces vertical to the direction of thickness T) 10a and 10b of a core 10, and side-face (front face vertical to said both sides) 10c, in drawing 2 , the epidermis material 20 is wearing only said both sides 10a and 10b of a core 10.
[0007] A core 10 uses gypsum fibrosum 11 as a principal component, and makes zeolite particle 12 group and diatomaceous earth particle 13 group intermingled in gypsum fibrosum 11. the ratio (weight ratio) of zeolite particle 12 group -- a core -- it is 10 - 40% of the 10 whole, and the path of the zeolite particle 12 is about 0.6mm or less. the ratio (weight ratio) of diatomaceous earth particle 13 group -- a core -- it is 10 - 40% of the 10 whole, and the path of the diatomaceous earth particle 12 is also about 0.6mm or less. The zeolite particle 12 has what is not calcinated, and the calcinated thing. The burning temperature of the zeolite particle 12 is about 300 degrees C - 700 degrees C. In addition, the absorption of the zeolite particle 12 and an ion-exchange

operation improve by baking. the epidermis material 20 -- the permeability of the cardboard for boards, recycled paper, cloth, etc., and a connoisseur -- it is an aquosity **** sheet-like thing and the thickness of the epidermis material 20 is about 0.35mm. The epidermis material 20 is stuck to the front face of a core 10 by pressure. In addition, the part 21 with which the epidermis material 20 lapped is a part for jointing by adhesives.

[0008] The manufacture approach of the above-mentioned building materials is as follows. First, the raw material of the core 10 adds water to what mixed powder exsiccated gypsum (plaster), the zeolite particle 12, the diatomaceous earth particle 13, and a small amount of add-in material (a glass fiber, foam, adhesion enhancement material, coagulation adjustment material, etc.), and it was made to have viscosity is formed. Since it is formed of said foam so that many air bubbles of a 0.02-0.5mm diameter may be scattered in a core 10, while the specific gravity of a core 10 is set to 0.8-0.9 and becomes lighter than water by it, the permeability, the water flow nature, the noise control effectiveness, and adiabatic efficiency of a core 10 become large. In addition, said add-in material may not be. Next, it puts into the tray of the predetermined magnitude which does not illustrate the above-mentioned raw material. At this time, the cardboard used as the epidermis material 20 etc. is arranged along the side face if needed [a base and if needed] in a tray. Furthermore, said epidermis material is put on the front face of said raw material into which it was put by the tray. Next, if the pressure welding of said epidermis material with which it was put in by the tray, and said raw material is carried out, while said raw material will become hard, said epidermis material 20 is stuck to the front face of a core 10 by pressure.

[0009] In addition, in the production line which used the belt type conveyor, building materials are manufactured as follows as other manufacture approaches. First, while inserting the raw material of said core 10 by the epidermis material 20, inserting said epidermis material 20 with the roller of a couple, carrying out the pressure welding of the raw material and the epidermis material 20 of said core 10 for the raw material and the epidermis material 20 of a core 10 with delivery and solidifying a core 10, the epidermis material 20 is stuck to a core 10 by pressure. Then, the core 10 which stuck the epidermis material 20 by pressure is dried, and it cuts to predetermined die length, and considers as building materials. In addition, the approach which is not limited to said sticking by pressure, but fixes the epidermis material 20 to a core 10 with adhesives is sufficient as the approach of fixing the epidermis material 20 to a core 10.

[0010] It sets to drawing 3 and is the die length L1 of building materials. It is 1880mm, 2400mm, 2700 etc.mm, etc., for example, and is the width of face W1 of building materials. It is 910mm, for example and is thickness T1. For example, they are 9.5mm, 12.5mm, 15mm, 24 etc.mm, etc. It sets to drawing 4 and is the die length L2 of building materials. It is 455mm, for example and is the width of face W2 of building materials. For example, W1 of drawing 3 It is the same and is the thickness T2 of building materials. For example, they are 9mm, 12 etc.mm, etc.

[0011] Drawing 5 is a graph which shows the equilibriam water content ratio of the ingredient of building materials. In drawing 5 , an axis of abscissa shows relative humidity and an axis of ordinate shows the equilibrium moisture content of the ingredient of building materials. As an ingredient, the result of having tested "Tamara Ito (trade name of a domestic zeolite)", the zeolite from China, and diatomaceous earth is shown. The graph shows the equilibrium moisture content of each ingredient when leaving each ingredient in the ambient atmosphere of each relative humidity. In drawing 5 , it turns out that the equilibrium moisture content of diatomaceous earth is far larger than the equilibrium moisture content of a zeolite. For this reason, it turns out that the moisture absorption capacity of diatomaceous earth is higher than a zeolite. In addition, although the path of the hole of a zeolite is a micron unit, since the path of the hole of diatomaceous earth is about 0.1mm, it can be said that diatomaceous earth fits absorption and desorption of moisture.

[0012] Drawing 6 shows the equilibrium moisture content of a board. In drawing 6 , an axis of abscissa is relative humidity and an axis of ordinate is the equilibrium moisture content of a board. The graph shows the equilibrium moisture content of each board for a test when leaving "the plaster board which contains diatomaceous earth 30% by the weight ratio" (what was displayed as "30% of diatomaceous earth"), "the board of only gypsum fibrosum" (what was displayed as "GBR"), and "the plaster board which contains a zeolite 30% by the weight ratio" (what was displayed as "zeolite 30%") in each relative humidity as a board for a test. In drawing 6 , it turns out that the equilibrium moisture content of "the plaster board which contained diatomaceous earth 30% by the weight ratio" is far larger than the equilibrium moisture content of other boards for a test. For this reason, it turns out that the moisture absorption capacity of "the plaster board which contained diatomaceous earth 30% by the weight ratio" is higher than other boards for a test.

[0013] Drawing 7 shows the absorption-and-desorption-of-moisture test result of each board for a test. In drawing 7 , an axis of abscissa is time amount and an axis of ordinate is the weight rate of increase by moisture absorption of each board for a test. change of the temperature according to the passage of time as a test condition, and relative humidity -- ** temperature of 25 degrees C, the 50% [of relative humidity] ->** temperature of 25 degrees C, the relative humidity 90% 24-hour ->** temperature of 25 degrees C, and relative humidity -- it comes out 50% for 24 hours. It moves from the test condition of the above-mentioned ** to the test condition of **, and moves to the test condition of ** further at the time of termination of the test condition of **. It is the start event of the test condition of the above-mentioned ** at the time amount 0 event of the axis of abscissa of drawing 7 . As a board for a test, "the plaster board which contains diatomaceous earth 30% by the weight ratio", "the board of only gypsum fibrosum", and "the plaster board which contains a zeolite 30% by the weight ratio" are used. In addition, the display of each board is the same as drawing 6 . In drawing 7 , it turns out that change of the weight rate of increase of the plaster board which contained diatomaceous earth 30% by the weight ratio is farther [than change of the weight rate of increase of other boards for a test] large. For this reason, it turns out that the absorption-and-desorption-of-moisture capacity of "the plaster board which contains diatomaceous earth 30% by the weight ratio" is farther [than the absorption-and-desorption-of-moisture capacity of other boards for a test] large.

[0014] the epidermis material 20 which covers a core 10 by the above configuration -- permeability and a connoisseur -- an aquosity **** thing -- it is -- this epidermis material 20 -- passing -- permeability and a connoisseur -- air is deodorized by zeolite particle 12 group in a core 10 among "the moisture in air and air" which reached the core 10 which uses aquosity **** gypsum fibrosum as a principal component, it is purified, and absorption/emission of the moisture in air is carried out by diatomaceous earth particle 13 group, and absorption and desorption of moisture of the air is carried out. In addition, since much pores which lead to the front face of gypsum fibrosum 11 exist in the gypsum fibrosum 11 of a core 10, gypsum fibrosum 11 has absorptivity and permeability. For this reason, while being able to carry out deordorization and clarification of air according to the absorption of zeolite particle 12 group and ion-exchange operation which are intermingled inside gypsum fibrosum 11, absorption and desorption of moisture can be carried out by diatomaceous earth particle 13 group which exists in the interior of gypsum fibrosum 11. Furthermore, building materials can become that a core 10 is a panel-like panel-like, the surface area of building materials can become large, and building materials can be arranged so that front faces, such as a wall and head lining, may be worn. In this case, building materials can perform absorption and desorption of moisture in deordorization and the clarification list of air efficiently.

[0015] furthermore, the core of said zeolite particle 12 group -- since the weight ratios to the 10 whole are 10 thru/or 40%, while said zeolite particle 12 group can perform deordorization and clarification of air efficiently -- the core of said diatomaceous earth particle 13 group -- since the weight ratios to the 10 whole are 10 thru/or 40%, said diatomaceous earth particle 13 group can perform absorption and desorption of moisture of air efficiently. furthermore, the core of the sum total of said zeolite particle 12 group and said diatomaceous earth particle 13 group -- since the weight ratio to the 10 whole is 60 or less % -- the core of gypsum fibrosum 11 -- the weight ratio to the 10 whole is maintained to 40% or more. For this reason, since a role of a binding material of gypsum fibrosum 11 is not spoiled, the reinforcement of a core 10 can be maintained.

[0016]

[Effect of the Invention] the epidermis material which was fixed on the surface of the core according to the building materials concerning invention of the 1st of this application -- permeability and a connoisseur -- an aquosity **** thing -- it is -- this epidermis material -- passing -- permeability and a connoisseur -- the air which reached the core which uses aquosity **** gypsum fibrosum as a principal component -- a core -- while being deodorized by the inner zeolite particle group and purified -- said core -- absorption and desorption of moisture of air is carried out by the inner diatomaceous earth particle group. For this reason, by using the building materials concerning the invention in this application, change of the relative humidity of indoor air can be lessened, indoor dew condensation can be prevented, and the indoor natural environment near wooden building can be made. Furthermore, since adiabatic efficiency is high, a diatomaceous earth particle can heighten the adiabatic efficiency of building materials. Moreover, since a diatomaceous earth particle and a zeolite particle are used, cost can be made cheap.

[0017] furthermore, the effectiveness [according to the building materials concerning the 2nd invention] by the 1st above-mentioned invention -- the core of said zeolite particle group -- since the weight ratios to the whole are 10 thru/or 40%, while said zeolite particle group can perform deordorization and clarification of air

efficiently -- the core of said diatomaceous earth particle group -- since the weight ratios to the whole are 10 thru/or 40%, said diatomaceous earth particle group can perform absorption and desorption of moisture of air efficiently. furthermore, the core of the sum total of said zeolite particle group and particle group of said diatomaceous earth -- since the weight ratio to the whole is 60 or less % -- the core of gypsum fibrosum -- the weight ratio to the whole is maintained to 40% or more. For this reason, since a role of a binding material of gypsum fibrosum is not spoiled, the reinforcement of a core can be maintained.